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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER				
SITTA, GRANT				
ART UNIT		PAPER NUMBER		
2629				
NOTIFICATION DATE		DELIVERY MODE		
11/23/2011		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

vera.kublanov@philips.com

debbie.henn@philips.com

marianne.fox@philips.com

Office Action Summary

Application No.

10/564,917

Applicant(s)

JOHNSON ET AL.

Examiner

GRANT SITTA

Art Unit

2629

Period for Reply -- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 1-14 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1-14 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. ____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI) Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 2, 6, 7, 8-9, and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friend et al (6,429,601) hereinafter, Friend in view of Aoki et al (2002/0003520) hereinafter, Aoki.

4. In regards to claims 1 and 14, Friend teaches an active matrix (**col. 4, lines 14-15 and abstract**) display device (6) comprising a display (2) with a plurality of display pixels (3), each having (**fig. 6 (23, 23, 21)**):

a current driven emissive element (14)(**fig. 5 19a-19d**);

a data input (10) for receiving an analogue data signal (**fig. 5 input to (34)**);

at least one drive element (T2) connected to a power supply and arranged to drive said current emissive element (14) in accordance with said data signal (**fig. 5 15a-d, 13a connected to data line, and connected to the scan line (10)**);

selecting means arranged to provide (**fig. 5 (13a-d)**), in response to a select signal (18) (**fig. 5 10 scan line**), said data signal to said at least one drive element (T2) to generate an overall brightness level during a frame period (F) in accordance with said data signal (**fig. 7 and 8 and col. 7, lines 18-35**), wherein said device (6) is adapted to divide said frame period (F) in at least a first sub-period (F1) during which said emissive element (**fig. 8 pulses contained in a frame**)(14) carries a first non-zero current (I1) (**fig. 8 up arrow next to current and corresponding pulses, set of two pulses**) and a second sub-period (F2) during which said emissive element (14) carries a second non-zero current (I2) (**fig. 8 second of two pulses**), wherein said first and second non-zero current over their respective sub-periods substantially yielding said overall brightness level (**col. 7, lines 18-35 total overall brightness**)

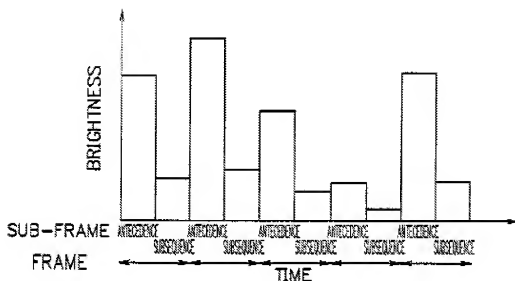
said first non-zero current is determined based on a known ratio with respect to said second non-zero current (**fig. 8 col. 7, lines 18-35 determined**) .

Friend fails to teach wherein said second non-zero current is maintained at a stable level lower than the first non-zero current and said first non-zero current is reduced in value based on a known ratio with respect to said second non-zero current, said second non-zero current during said second sub-period achieving a brightness that

is known percent of a brightness achieved by said first non-zero current in said first sub-period.

However, Aoki teaches wherein a second non-zero current (fig. 9 subsequent) is maintained at a stable level lower than a first non-zero current and said first non-zero current is reduced in value based on a known ratio ([0058] $1/4$) with respect to said second non-zero current [0058], said second non-zero current during said second sub-period achieving a brightness that is known percent of a brightness achieved by said first non-zero current in said first sub-period wherein said first and second non-zero current over their respective sub-periods substantially yielding said overall brightness level in accordance with said data signal. [0009-0011]. Examiner notes, the overall all brightness does not precluded any addition luminance generated on top of what is contained in the original data signal.

FIG. 9



It would have been obvious to one of ordinary skill in the art to modify the second non-zero current of Friend wherein said second non-zero current is maintained at a stable level lower than the first non-zero current and said first non-zero current is reduced in value based on a known ratio with respect to said second non-zero current, said second non-zero current during said second sub-period achieving a brightness that is known percent of a brightness achieved by said first non-zero current in said first sub-period, as taught by Aoki in order to "[0009] to provide a display device which prevents

the moving picture from being unclear and blurred or disordered, at the same time, controls the lowering of brightness of the picture.”

5. In regards to claim 2, Friend teaches an active matrix display device (col. 4, lines 14-15) (6) according to claim 1, wherein said device (6) comprises a display controller (7) (fig. 6 (24) control apparatus) for generating said select signal (18) (fig. 6 (25) and fig. 5 scan lines (10)), said select signal (18) comprising at least a first select signal (18') triggering said first sub-period (F1) and a second select signal (18'') triggering said second sub-period (F2) (fig. 7 and 8 and col. 7, lines 18-35).

6. In regards to claim 6, Friend teaches an active matrix display device (6) according to claim 1, wherein said device (6) comprises a display controller (7) adapted to generate at least said first current (I1) and said second current (I2) by varying a voltage (13;15) over said current driven emissive element (14) (fig. 6 (24), fig. 7 varied current and col. 7, lines 18-35).

7. In regards to claim 7, Friend teaches an active matrix display device (6) according to claim 1, wherein said drive element (T2) is a thin film transistor having a short channel length (col. 4, lines 3-25).

8. In regards to claim 8, Friend teaches active matrix display device (6) according to claim 1, wherein said display pixels (3) are arranged in a matrix of rows (4) and columns

(5), said device (6) comprising lines (13;15) for manipulating a voltage for said drive element (T2) for each row (4) or group of rows (4), and said device (6) comprises a display controller (7) adapted to scan said lines (13;15) along said rows (4) or group of rows (4) across the display (2) (fig. 6 25, 26 and fig. 8 pulses col. 7, lines 28-67).

9. In regards to claim 9 Friend as modified by Aoki teaches wherein said device (6) is adapted to yield a brightness at said second non-zero current (I2 Friend) of 30% or less of the brightness at said first non-zero current (I1) ([0058] $\frac{1}{4}$ <30% Friend).

10. In regards to claim 10, Friend teaches an active matrix display device (6) according to claim 1, wherein said display (2) comprises a subset of display pixels (3) or emissive elements (14) and said device (6) is adapted to supply said first non-zero current (I1) and said second non-zero current (I2) to only said subset (col. 7, lines 36-67).

11. In regards to claim 11, Friend teaches an active matrix display device (6) according to claim 10, wherein said display pixels (3) are coloured display pixels comprising red, green and blue emissive elements (14) and said subset is defined by colour (col. 6, lines 1-10) .

12. In regards to claim 12, Friend teaches an active matrix display device (6) according to claim 11, wherein said subset consists of said red and blue emissive elements (14) (col. 6, lines 5-10).

13. In regards to claim 13, Friend teaches an active matrix display device (6) according to claim 11, wherein said subset consists of said green emissive elements (col. 6, lines 5-10).

14. Claims 3, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friend and Aoki in view of Yamazaki et al (6,326,941) hereinafter, Yamazaki.

15. In regards to claim 3, Friend and Aoki differs from the claimed invention in that Friend and Aoki do not disclose wherein said first sub-period (F1) and said second sub-period (F2) are of different duration

However, Yamazaki teaches a system and method for wherein said first sub-period (F1) and said second sub-period (F2) are of different duration (fig. 5b col. 7, lines 1-56 varied duration and current of Yamazaki).

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to modify Friend and Aoki to include the use of various pulse shapes during sub-periods or different durations of sub-periods as taught by Yamazaki in order to improve display quality with higher gradation between frame as stated in (col. 3, lines 35-67).

16. In regards to claim 4, Friend and Aoki as modified by Yamazaki teaches an active matrix display device (6) according to claim 3, wherein said first sub-period (F1) has a shorter duration than said second sub-period (F2) (fig. 5b 64To and 16To Yamazaki).

17. Claim 5 is rejected for the same reasons as claim 3. Furthermore, Friend and Aoki as modified by Yamazaki teaches an active matrix display device (6) according to claim 1, wherein said first non-zero current exceeds said second non-zero current (fig. 9 antecedence larger than subsequence Aoki) and (fig. 5b 64 To, 16 To Yamazaki).

Response to Arguments

Applicant's arguments filed 1/13/2011 have been fully considered but they are not persuasive.

Applicant contends, neither Friend nor Aoki provide any teaching regarding reducing the voltage in the first sub-frame such that "said first and second non-zero current over their respective sub-periods substantially yielding said overall brightness level in accordance with said data signal." Examiner respectfully disagrees.

Examiner acknowledges it appears as if Aoki applies the original luminance to the antecedence subframe (fig. 8 SC1 and [0053-0059]). The subsequence subframe is set to a predetermined fraction of the original image data [0055]. For example if the first subframe is 100% the subsequent subframe would be 25% yield an overall brightness of 125%. Examiner understands applicant specification to yield 100% brightness, for example 75% in the first subframe and 25% in the second subframe.

However, Examiner asserts the prior art currently reads on the claims as written since, Examiner is viewing "yielding said overall brightness level in accordance with said data signal" as the overall brightness, or the 125%. The claims state the data signal is

used to generated an overall brightness which would include the ultimate overall brightness and not preclude a brightness over 100%.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GRANT SITTA whose telephone number is (571)270-1542. The examiner can normally be reached on M-F 9-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexander Beck can be reached on 571-272-7765. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Grant D Sitta/
Primary Examiner, Art Unit 2629

